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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/825,242

Filing Date: April 02, 2001

Appellant(s): EISENBERG ET AL.

Joe Liebeschuetz
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11 March 2005 appealing from the Office
action mailed 07 October 2004

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

In view of the withdrawal in this Examiner's answer of the rejection of claims 35, 37, 38, 40, 42, 43, 48, 49, and 53 under 35 U.S.C. 103(a) as being unpatentable over Choo et al. (1994b) in view of Choo et al. (1994a) in view of Isalan et al. that is detailed below, the status of the claims is corrected to be as follows. Claims 35, 37, 38, 40-43, 48, 49, 52, and 53 are pending. Claims 35, 40, 48, 49, and 53 are rejected and appealed. Claims 37, 38, 41-43, and 52 are allowed. Claims 1-34, 36, 39, 44-47, 50, and 51 are cancelled. In the brief claim 26 is listed instead of claim 36 as cancelled.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. the rejection of claims 35, 37, 38, 40, 42, 43, 48, 49, and 53 under 35 U.S.C. 103(a) as being unpatentable over Choo et al. (1994b) in view of Choo et al. (1994a) in view of Isalan et al. in view of the applicant's arguments presented on pages 13-14 of the Brief filed 11 March 2005 that Isalan et al. shows that zinc fingers should be used in context with their original neighboring zinc fingers, rather than used as interchangeable units that retain their original positions in a recombinant zinc finger protein as claimed in the instant application.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

Choo et al. (1994b) In vivo repression by a site-specific DNA-binding protein designed against an oncogenic sequence. Nature Vol. 372, pages 642-645 (1994)

Choo et al. (1994a) Toward a code for the interactions of zinc fingers with DNA: Selection of randomized fingers displayed on phage. Proc. Natl. Acad. Sci. USA Vol. 91, pages 11163-11167 (1994)

Corbi et al. Synthesis of a new zinc finger peptide; comparison of its 'code' deduced and 'CASTing' derived binding sites. FEBS Letters Vol. 417, pages 71-74 (1997)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 35, 40, 48, 49, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choo et al. (1994b) (Nature Vol. 372, pages 642-645, reference DB in the information disclosure statement filed 02 April 2001) in view of Choo et al. (1994a) (Proc, Natl. Acad. Sci. USA Vol. 91, pages 11163-11167, reference DD in the information disclosure statement filed 02 April 2001) in view of Corbi et al.

The claims are drawn to a method of making a zinc finger protein or a polynucleotide encoding a zinc finger protein comprising three zinc fingers that binds to a target site by using a database that comprises a plurality of precharacterized zinc finger protein sequences in which the zinc finger domains are correlated with their respective DNA binding target. The database comprises a zinc finger protein that has a third finger that is different from the third finger of at least one other protein in the database. In some embodiments the claims are drawn to computers or computer programs that execute the method, or a computer mediated method.

Choo et al. (1994b) shows a method of designing a zinc finger protein that binds to a BCR-ABL recombined oncogene target site. Choo et al. (1994b) shows on pages 642-643 that each triplet of the intended binding site (shown in figure 1) was used to screen a randomized zinc finger library made by the method of Choo et al. (1994a). Selected zinc fingers that bound a desired triplet were combined into a set of three finger zinc finger proteins shown in figure 2 and further screened to select the zinc finger protein that bound the intended binding site. One three

finger zinc finger protein designated 1A-2A-3B was selected for expression. The expressed zinc finger protein bound the intended binding site as shown in figure 3. Choo et al. (1994b) does not explicitly show that the randomized library of zinc finger proteins consists of three finger zinc finger proteins, and further does not show the extent of precharacterization of the zinc finger proteins in the randomized zinc finger library or a database of the randomized zinc finger library. Choo et al. (1994b) does not show a computer-mediated method or computers or programs that execute the method. Choo et al. (1994b) does not show a database comprising a zinc finger protein that has a third finger that is different from the third finger of at least one other protein in the database.

Choo et al. (1994a) shows on pages 11163-11164 a phage library comprising zinc finger genes in which the middle of three fingers is randomized. Choo et al. (1994a) shows on pages 11164-11166 that the library can be used to screen for library members that bind the middle triplet of choice of a polynucleotide binding target. Choo et al. (1994a) shows in figure 1 the three fingers and three alternative polynucleotide binding targets. Choo et al. (1994a) shows in figure 2 a database of selected and characterized library members. Choo et al. (1994a) discusses the amino acid sequence and putative secondary structures of the binding region of the selected library members.

Corbi et al. shows a zinc finger gene and protein termed Mago in figures 1-2. The zinc finger protein has three fingers. Corbi et al. shows in figure 3 the sequence of the target binding site recognized by the zinc finger protein. The third finger has a different sequence than that of the ZIF268 third finger, which appears in the database of Choo et al. (1994a).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to precharacterize the selected random library members of Choo et al. (1994b) to any desired extent to aid in further analysis of selected library members because Choo et al. (1994a) shows such analysis in figure 2 and pages 11164-11167. It would have been further obvious to record such characterizations in a database as shown in Choo et al. (1994a) figure 2. It would have been further obvious to automate the generation and use of their database by use of computers and appropriate programs because it is obvious to one of ordinary skill in the art to automate a process (see MPEP 2144.04). It would have been further obvious to add other known zinc finger proteins and their binding specificities such as the Mago zinc finger protein of Corbi et al. to further increase the diversity of choices available in the database of zinc finger proteins because Choo et al.(1994b) shows on pages 642-643 that zinc finger proteins designed using fingers from the database had variability in their affinity and subsequent screening was required to select zinc finger proteins of high affinity.

(10) Response to Argument

The applicants state on page 7 that the cited references do not show databases of a three finger zinc finger protein, however Choo et al. (1994a) makes clear in the second column of page 11163 that the library contains variants of a three finger Zif268 protein, and the tables show relevant characteristics of the members of the library. Although Choo et al. (1994a) does not list the entire sequence of each zinc finger protein in the table, the table is nevertheless a table of precharacterized three finger zinc finger proteins as claimed. The applicants state on page 8 that the library members detailed in Choo et al. (1994a) are not the members selected by Choo et al. (1994b), however the combination of references shows a large precharacterized library of

2,600,000 members on page 11164 second column that are characterized as to binding specificity to a wide range of target nucleotide triplets in Figure 2. Choo et al. (1994b) further characterized the library of Choo et al. (1994a) to detect desired binding specificities for the purpose of designing three finger zinc finger proteins, as recited in the claims. The applicants state on page 8 that Choo et al. (1994a) does not show use of the library for design of zinc finger proteins, however Choo et al. (1994a) shows such guidance in at least the last sentence of page 11163. The applicants state on page 9 that the precharacterized zinc finger of Corbi et al. has a different binding specificity than that sought by Choo et al. (1994b), however it would have been obvious to make the precharacterized zinc finger library and associated database as large as possible to allow for selection of zinc fingers of any desired specificity, as noted in Choo et al. (1994a) at the bottom of the second column of page 11164. The applicants state that automation of the database by computer methods is not obvious, however the large size of the zinc finger library makes complete characterization impractical without computer-mediated entry and search capabilities of the associated database.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 1631

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

John S. Brusca 13 August 2005
John S. Brusca

Conferees:

Ardin Marschel

Ardin H. Marschel 4/16/05
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